


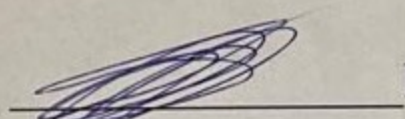
**NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES
OF UKRAINE**

Department of Statistics and Economic Analysis


" 30 " 2023

«CONFIRMED»
Dean of Economic Faculty,
A. D. DIBROVA

«APPROVED»
at the meeting of the department
of Statistics and Economic Analysis
Record № 12 dated on "28" April 2023
Head of Department

I.D. LAZYSHYNA


«REWIEVED»
Program Coordinator
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PROGRAM OF THE COURSE

**"ANALYSIS IN APPLICATION SOFTWARE SOLUTIONS IN THE
AGRICULTURAL SECTOR"**

Specialty 071 "Accounting and Audit"
Educational program "Analytical, accounting, and legal support of business"
Faculty of Economic
Developer **Olena BOHDANIUK**, Associate Professor of the Department of
Statistics and Economic Analysis, PhD in Economics, Associate Professor

Kyiv – 2023

1. Description of the course

“ANALYSIS IN APPLICATION SOFTWARE SOLUTIONS IN AGRICULTURAL SECTOR”

Field of knowledge, specialty, educational program, educational degree		
Educational degree	Bachelor	
Specialty	071 "Accounting and Audit"	
Educational program	"Analytical, accounting, and legal support of business"	
Characteristics of the course		
Type	Selective	
Total number of hours	150	
Number of ECTS credits	<u>5</u>	
The number of structural modules	<u>2</u>	
Course project (work) (if applicable)	_____	
Form of control	Exam	
Indicators of the course for full-time and part-time forms of study		
	Full-time form of study	Part-time form of study
Course (year of study)	<u>3</u>	
Semester	<u>6</u>	
Lecture classes	_____ hours	
Practical, seminar classes	_____ hours	
Laboratory classes	45 hours	
Self-study	105 hours	
Individual assignments	_____ hours	
Number of weekly classroom hours for the full-time form of study	2.5 hours	

2. Purpose, tasks, and competencies of the course

The purpose acquisition of practical use of applied software solutions for analysis in the agricultural sector.

Objectives:

- Assessments of types of economic information. Database.
- To learn the levels of analysis in applied software solutions.
- To consider analytical application solutions for business entities of the agricultural sector.
- Using of Advanced Excel for Business Analysis.
- Considering Power BI for Business decisions and analytical reporting.
- To learn Google Analytics and YouControl as an analytical system for compliance, market analysis, business intelligence and investigations.

Acquisition of competencies:

- *Integral competence (IC):*

The ability to solve complex specialized tasks and practical problems in the field of accounting, auditing, analysis and taxation in process of professional activity, which involves the application of theories and methods of economic science and is characterized by complexity and uncertainty of conditions.

- *General competencies (GC):*

GC 1. Ability to learn and be ready to learn and apply acquired knowledge.

GC 2. Ability to analyze and synthesize as a tool for identifying problems and making decisions to solve them based on logical arguments and verified facts.

GC 9. Skills in using modern information and communication technologies.

- *Special (professional, subject) competencies (SC)*

SC 3. Ability to use mathematical tools to study economic processes, solve applied economic and optimization problems in the field of accounting, auditing, and taxation.

SC 7. Ability to implement accounting procedures using specialized information systems and computer technology.

SC 8. Ability to apply and form information support for enterprise management using modern technical and methodological tools.

- *Program learning outcomes (PLO):*

PLO 8. Substantiate the effectiveness of decision-making using accounting and analytical information and understand the organizational and economic mechanism of enterprise management.

PLO 11. Apply specialized information systems and computer technologies for accounting, analysis, audit and taxation.

3. Structure of educational Discipline:

Topic 1. Types of economic information. Database

Economic data is a sub-category of financial markets data. Economic data refers to data concerning information on the various sectors and aspects of an economy. Data that primarily based on the foundations of record keeping and statistics and contains facts and figures on the economy of any given location or country. Collected and compiled on a periodic basis - either monthly, quarterly, or yearly. How is Economic Data collected. Data providers and vendors listed on Datarade sell Economic Data products and samples. Popular Economic Data products and datasets.

Topic 2. Levels of analysis in applied software solutions

Level of analysis is used in the social sciences to point to the location, size, or scale of a research target. It is distinct from unit of observation in that the former refers to a more or less integrated set of relationships while the latter refers to the distinct unit from which data have been or will be gathered. Together, the unit of observation and the level of analysis help define the population of a research enterprise. *Micro level*. The smallest unit of analysis in the social sciences is an individual in their social setting. At the micro level, also referred to as the local level, the research population typically is an individual in their social setting or a small group of individuals in a particular social context. Examples of micro levels of analysis include. *Meso level*. In general, a meso-level analysis indicates a population size that falls between the micro and macro levels, such as a community or an organization. *Macro level*. Macro-level analyses generally trace the outcomes of interactions, such as economic or other resource transfer interactions over a large population

Topic 3. Analytical application solutions for business entities of the agricultural sector

To learn AGMEMOD, Agri-Analytica and YouControl as an analytical system for compliance, market analysis, business intelligence and investigations.

Topic 4. Advanced Excel for Business Analysis

How to merge data from different sources using VLOOKUP, HLOOKUP, INDEX MATCH, and XLOOKUP. How to split data using text functions SEARCH, LEFT, RIGHT, MID. How to standardize and clean data ready for analysis in Excel. About using the PivotTable function to perform data analysis. How to display your analysis using Pivot Charts in Excel. Conducting a Linear Forecast and Forecast Smoothing in Excel. All about Histograms and Regression in Excel. How to use Goal Seek, Scenario Manager, and Solver to fill data gaps in Excel.

Topic 5. Power BI for Business decisions and analytical reporting

Microsoft Power BI as a collection of software services, apps, and connectors that work together to help you create, share, and consume business insights in the way that serves you and your business most effectively. Use of Power BI to integrate multiple data sets; others seek to streamline their reporting processes. Most want to tap into the potential of analytics to make strategic business decisions for their company's future. Using Power BI on the same page, collaborating in a sophisticated platform and easily wielding data. You can gather insight, compare historic and real-time data, create compelling reports, and predict outcomes based on trends. Decisions that enhance your business, from overall process.

Topic 6. Google Analytics

Google Analytics used to track website activity such as session duration, pages per session and the bounce rate of individuals using the site, along with the information on the source of the traffic. It can be integrated with Google Ads, with which users can create and review online campaigns by tracking landing page quality and conversions (goals). Goals might include sales, lead generation, viewing a specific page, or downloading a particular file. Google Analytics' approach is to show high-level, dashboard-type data for the casual user, and more in-depth data further into the report set. Google Analytics analysis can identify poorly performing pages with techniques such as funnel visualization, where visitors came from (referrers), how long they stayed on the website and their geographical position. It also provides more advanced features, including custom visitor segmentation. Google Analytics e-commerce reporting can track sales activity and performance. The e-commerce reports show a site's transactions, revenue, and many other commerce-related metrics.

Topic 7. YouControl as an analytical system for compliance, market analysis, business intelligence and investigations

Monitoring of official information of counterparties on information from open data; Solutions in the field of corporate economic and information security;

Competitive intelligence, business analytics, compliance; Analysis of declarations and public procurement. The request by [EDRPOU code](#), name, name of the director or founder, address, telephone number and [RNOKPP](#). You can also filter businesses by region, type of activity, status, etc. The counterparty card consists of specialized tabs that contain comprehensive information in the form of a dossier: registration information, taxpayer status, licenses and permits, court decisions, official notifications and history of changes, as well as analytics: financial and foreign economic analysis, relations between affiliates (including historical), government tenders, property (trademarks, vehicles, land, real estate), national politically exposed persons, inspections.

Express analysis of a counterparty is the result of counterparty analysis by more than 500 risk factors. The system independently analyzes the basic data about the company and assigns the appropriate marking, depending on the level of possible risk.

Search for connections allows you to find connections between two counterparties by different types of connections (founders and beneficiaries, director or signatory, legal successors, branches, name, address, telephone), as well as automatically search for affiliates of the selected legal entity.

Groups: a tool that allows you to share lists of counterparties to form a common information space of the team.

The list of registers is an analyst's directory, which contains direct links to 169 Ukrainian and 250 world registries, as well as what data is contained in these registers. The module on verification of individuals is the first digital tool for checking and managing the risks of cooperation with individuals, contains a wide range of open information about individuals.

Structure of educational Discipline for:
– students of full-time education

Names of Modules and Topics	Number of hours												
	Full-time form							Distance form					
	W	Total	including					Total	including				
			L	Se m.	Pr.	Lab	Self		L	Se m.	Pr.	Lab	Self
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Module 1. Framework of analysis in applied software solutions in the agricultural sector													
Topic 1. Types of economic information. Database	1	17				2	15						
Topic 2. Levels of analysis in applied software solutions	2	22				2	20						
Topic 3. Analytical application solutions for business entities of the agricultural sector	3-5	20				10	10						
Total for module 1		59				14	45						
Module 2. Analysis in universal application software solutions													
Topic 4. Advanced Excel for Business Analysis	6-10	29				14	15						
Topic 5. Power BI for Business decisions and analytical reporting	11-13	25				10	15						
Topic 6. Google Analytics	14	19				4	15						
Topic 7. YouControl as an analytical system for compliance, market analysis, business intelligence and investigations	15	18				3	15						
Total for module 2		95				35	60						
Grand Total		150				45	105						

4. Topics of seminars

5. Topics of practical classes

№	Name of Topics	Number of hours

6. Topics of lab classes

№	Name of Topics	Number of hours
1	Types of economic information. Database	2
2	Levels of analysis in applied software solutions	2
3	Analytical application solutions for business entities of the agricultural sector	10
4	Advanced Excel for Business Analysis	14
5	Power BI for Business decisions and analytical reporting	10
6	Google Analytics	4
7	YouControl as an analytical system for compliance, market analysis, business intelligence and investigations	3
Grand Total		45

7. Topics of self-study

№	Name of Topics	Number of hours
1	Types of economic information. Database	15
2	Levels of analysis in applied software solutions	20
3	Analytical application solutions for business entities of the agricultural sector	
4	Advanced Excel for Business Analysis	10
5	Power BI for Business decisions and analytical reporting	15
6	Google Analytics	15
7	YouControl as an analytical system for compliance, market analysis, business intelligence and investigations	15
Grand Total		105

8. Control questions, sets of tests for assessing the level of knowledge acquisition by students

1. Types of economic information.
2. Database. Main sources.
3. Macro level of analysis in applied software solutions.
4. Micro level of analysis in applied software solutions.

5. Projection of the agricultural sector of Ukraine using the model and AGMEMOD.
 6. Practical cases of the Agri-Analytica program (Agrarian's Cabinet – products and solutions for farmers).
 7. Analytical components of accounting software solutions.
 8. The classic tool "connection to external data sources": connection to external text files, pages on the Internet and databases
 9. Connection management, automatic update settings.
 10. Connection "SQL (database query language) - Excel"
 11. Power BI tools in Excel - POWER QUERY
 12. POWER QUERY: grouping, aggregation, Pivot and Unpivot, etc.
 13. Cells as variables, absolute, relative and mixed addressing.
 14. Deep understanding of Excel functions, arguments as input parameters.
 15. Use of text information processing functions: SEARCH, LEFT, MID, etc.
 16. The technique of creating complex formulas.
 17. Classics: VPR (VLOOKUP) and HPR (HLOOKUP) - all the nuances of use
 18. Exact or approximate match? We understand why there are two of them
 - INDEX and SEARCH (MATCH) - "tighten the untightened"
 19. We complicate and automate: complex cases of "data extraction".
 20. Visualization: graphs and diagrams with areas, their types. When suitable
 21. Visualization: combined charts.
 22. Customizing Visualizations and Appearance: Working with Chart Areas and the Format Tab.
 23. Working with the filter panel: filter sections for visualization, page and report.
 24. Rules for building information panels.
 25. Adding visualizations from reports to dashboards.
 26. Dashboard settings.
 27. Configuring the mobile view of the dashboard.
 28. Actions from the dashboard: discussion and teamwork, granting access
- (Pro)etting up notifications about data changes.

Tests

Question 1. Replace process, why did he use the entire address? This seems a bit cumbersome. Could he have simply looked for "Sydney" and then replaced all instances with "Pyrmont"? Which of the statements below are correct? (One or more answers are possible - partial credit will be awarded)...

1. What he did was correct, but he could have been quicker if he had simply typed in "Sydney" into the **Find what** field. He would have gotten the same results.
2. What he did was correct because Excel can only make changes in a cell when you enter the original full cell content into **Find what** and then the updated content into **Replace with**.

Question 2. A small business buys second-hand goods and then re-sells them at a local market. Which formula typed into C2 will help them calculate the profit made on item they bought for \$10 and sold for \$29.99?

	A	B	C
1	Purchase Price	Sale Price	Profit
2	10.00	29.99	

1. =A2-B2
2. =SUM(B2-A2)
3. =B2-A2
4. =A2*B2

Question 3. Payroll has to calculate the tax for each employee. First they must add the base salary to the commission and then calculate the tax on the total. Which formula does this correctly?

	A	B	C	D
1	Base Salary	Commission	Tax Rate	Tax to Pay
2	3296.99	494.55	28%	

1. =A2+(B2/C2)
2. =(A2+B2)*C2
3. =(A2+B2*C2)
4. =A2+B2/C2

Question 4. According to the data analytics company Gartner, the majority of companies reported the reason their big data projects failed is due to:

1. mostly technical failures, but also some organizational failures;
2. equal parts organizational and technical failures;
3. mostly organizational failures, but also some technical failures;
4. organizational failures only.

Question 5. True/False: Everybody in the analytics world agrees that your job as a data analyst is to ask and answer the one, true, right question.

- (1)
True
- (2)
False

Question 6. The S.M.A.R.T acronym to refer to goals that are:

1. Specific, Measureable, Attainable, Relevant, and Time-bound;
2. Specific, Measureable, Attainable, Realistic, and Time-bound;
3. Strategic, Measureable, Attainable, Relevant, and Time-bound;
4. Specific, Measureable, Active, Realistic, and Time-bound.

Question 7. Which of the following steps of the analytics project life cycle should you complete first?

1. Defining a SMART goal;
2. Making a dashboard;
3. Making a data analysis plan;
4. Analyzing data.

Question 8. True/False: Including the business metric that you will use to assess success in your business analytics project will make your project goal sufficiently specific to ensure success.

(1)

True

(2)

False

Question 9. Which of the SMART criteria are NOT met by this data analytics project goal (pay close attention to whether the options are words the SMART acronym stands for)?

The goal of this project is to, within 45 days, use the inventory, production, and customer service databases from national manufacturing plants to reduce the number of polo shirts returned for manufacturing defects.

1. Reasonable;
2. Specific;
3. Measurable;
4. Attainable;
5. Time-bound.

Question 10. The best charts for assessing the categories and subcategories listed in the intermediate layers of your SPAP include (select all that apply):

1. Bar charts;
2. Scatter plots;
3. Pie charts;
4. Line charts.

9. Teaching methods

Practical	Visual	Verbal	Working with book	Video- method
Experiments, exercises, training and productive work	Illustrations, demonstration, observation of students	Explanation, explanation, narration, conversation, instruction, lecture, discussion, debate	Reading	Viewing, Training, Exercises under the supervision of "electronic teacher" control

10. Forms of assessment

Control measures include current and final evaluation of student knowledge. Current control is carried out during practice and in the process of self-study in the following areas: rapid surveys, tests, tasks "right-wrong" problem.

11. Distribution of grades received by students

Evaluation of student knowledge is carried out on a 100-point scale and is converted to national grades according to Table 1 "Regulations and Examinations and Credits at NULES of Ukraine" (order of implementation dated 03.03.2021, protocol №7)

Student rating, points	National grade based on exam results	
	Exams	Credits
90-100	Excellent	Passed
74-89	Good	
60-73	Satisfactory	
0-59	Unsatisfactory	Not passed

In order to determine the rating of a student (listener) in the discipline R_{dis} (up to 100 points), the rating from the exam R_{ex} (up to 30 points) is added to the rating of a student's academic work R_{aw} (up to 70 points): $R_{dis} = R_{aw} + R_{ex}$.

12. Educational and methodological support

1. Regulations.
2. Complex teaching of the discipline.
3. Methodological guidelines for independent study courses.
4. Methodological guidelines for educational practices.

13. Recommended literature

Main

1. Том Фоусет, Фостер Провост. Data Science для бізнесу. Як збирати, аналізувати і використовувати дані. К. : Наш Формат, 2019. 400 с.
2. Бреус С. В. Методи та моделі прийняття управлінських рішень. *Інфраструктура ринку*. 2018. Вип. 24. С. 117-122. URL: <http://www.market-infr.od.ua/uk/24-2018>
3. Конрад Карлберг. Бізнес-аналіз з використанням Excel. Рішення бізнес-завдань. К., 2018. 578с.
4. BABOK Guide: Global Standard for Business Analysis – IIBA, International Institute of Business Analysis. 2015. URL: <https://www.iiba.org/standards-and-resources/babok/>.

Supporting literature

1. The Best Guide to Understand Advanced Excel Functions. URL: [Advanced Excel Functions \[The Only Excel Guide for 2023\] \(simplilearn.com\)](#).
2. Advanced Excel for business. URL: [Top Advanced Excel Courses - Learn Advanced Excel Online | Coursera](#).
3. Microsoft Excel 2019 Pivot Table Data Crunching (Business Skills)
4. Power Pivot and Power BI: The Excel User's Guide to DAX, Power Query, Power BI & Power Pivot in Excel 2010-2016 Paperback – January 1, 2016
5. Excel Dashboards and Reports, 2nd Edition.
6. "The Accidental Analyst: Show Your Data Who's Boss" by Eileen and Stephen McDaniel.
7. Edward Tufte, *The Visual Display of Quantitative Information*.
8. Information Graphics Hardcover – April 18, 2012
9. Practical Tableau: 100 Tips, Tutorials, and Strategies from a Tableau Zen Master 1st Edition
10. Brian Larson, Data Analysis with Microsoft Power BI 1st Edition.
11. Devin Knight, Brian Knight, et al. Microsoft Power BI: Quick Start Guide

Information resources

1. Верховна Рада України. URL: <http://zakon.rada.gov.ua/>
2. Кабінет Міністрів України. URL: <http://www.kmu.gov.ua/control/>
3. Державний Комітет статистики України. URL: <http://ukrstat.gov.ua/>
4. Продовольча та сільськогосподарська організація ООН (ФАО). URL: <http://www.fao.org/>
5. Світовий банк. URL: <http://www.worldbank.org/>
6. Євростат URL: <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home>
7. Рішення для бізнесу YouControl — повне досьє на кожну компанію України. URL: <https://youcontrol.com.ua>.